AMENDMENTS TO THE CLAIMS

1-30. (Cancelled)

31. (New) A transmission device for a wireless communication system, comprising:

a controller for receiving a first data frame, either coincident with a second data frame or during transmission of the second data frame, to be transmitted, and preempting transmission of one of the first data frame and the second data frame having a longest duration, in order to first transmit one of the first data frame and the second data frame having a shortest duration; and

a multiplexer for starting or resuming transmission of the one of the first data frame and the second data frame having the longest duration, after transmission of the one of the first data frame and the second data frame having the shortest duration.

32. (New) The transmission device of claim 31, further comprising a power controller for increasing a transmission power of the one of the first data frame and the second data frame having the longest duration, to be higher than that of the one of the first data frame and the second data frame having the shortest duration.

33. (New) The transmission device of claim 31, wherein the first data frame has a frame length of 5ms and the second data frame has a frame length of 20ms.

34. (New) The transmission device of claim 31, further comprising:

a second data frame generator for encoding second input data of a second bit stream that is longer than a first bit stream to generate the second data frame.

35. (New) The transmission device of claim 34, wherein the second data frame generator comprises:

a Cyclic Redundancy Check (CRC) generator for generating CRC bits according to the second input data of a second frame length;

a tail bit generator for generating tail bits and adding the generated tail bits to an output of the CRC generator;

a channel encoder for encoding a tail bit-added second frame data at a predefined coding rate; and

an interleaver for interleaving the encoded data frame by the second frame length.

36. (New) The transmission device of claim 31, further comprising:

a spreader for spreading an output of the multiplexer.

37. (New) The transmission device of claim 36, wherein the interleaver uniformly distribute symbols generated by encoding one data bit over the respective durations of the whole frame.

38. (New) The transmission device of claim 37, wherein the interleaver is designed according to a delete matrix given by

$$D_1 = \begin{bmatrix} 01110111\bullet\bullet\bullet \\ 10111011\bullet\bullet\bullet \\ 11011101\bullet\bullet\bullet \end{bmatrix}.$$

39. (New) The transmission device of claim 37, wherein the spreader comprises:

an orthogonal code spreader for spreading the one of the first data frame and the second data frame having the shortest duration output from the multiplexer with an orthogonal code for a dedicated control channel; and

a Pseudo-random Noise (PN) spreader for spreading an output of the orthogonal code spreader with a PN sequence.

40. (New) The transmission device of claim 31, wherein the first data frame and the second data frame are control data frames.

41. (New) A transmission method in a wireless communication system, comprising:

receiving a first data frame to be transmitted, wherein the first data frame is received coincident with a second data frame or during transmission of the second data frame;

preempting transmission of one of the first data frame and the second data frame having a longest duration, in order to first transmit one of the first data frame and the second data frame having a shortest duration; and

starting or resuming transmission of the one of the first data frame and the second data frame having the longest duration, after transmission of the one of the first data frame and the second data frame having the shortest duration.

42. (New) The data transmission method of claim 41, further comprising:

increasing a transmission power of the one of the first data frame and the second data frame having the longest duration, to be higher than that of the one of the first data frame and the second data frame having the shortest duration.

43. (New) The data transmission method of claim 41, wherein the first frame has a frame length of 5ms and the second frame has a frame length of 20ms.

44. (New) The data transmission method of claim 41, further comprising:

encoding second input data of a second bit stream that is longer than a first bit stream to generate the second data frame.

45. (New) The data transmission method of claim 44, wherein the second data frame generation step comprises:

generating Cyclic Redundancy Check (CRC) bits according to second data input of a second frame length;

generating tail bits;

adding the generated tail bits to the CRC bit-added second data frame;

encoding the tail bit-added second data frame at a predefined coding rate; and

interleaving symbols of the encoded second data frame by the second frame length.

46. (New)) The data transmission method of claim 45, wherein symbols generated by encoding one data bit are uniformly distributed over respective durations of the second data frame, in said interleaving step.

47. (New) The data transmission method of claim 46, wherein the symbols are distributed according to a delete matrix given by

$$D_1 = \begin{bmatrix} 01110111\bullet\bullet\bullet \\ 10111011\bullet\bullet\bullet \\ 11011101\bullet\bullet\bullet \end{bmatrix}.$$

48. (New) The data transmission method of claim 41, wherein the transmission step comprises the steps of:

spreading the one of the first data frame and the second data frame having the shortest duration with an orthogonal code; and

spreading an orthogonal spread signal with a Pseudo-random Noise (PN) sequence.

49. (New) The data transmission method of claim 41, wherein the first data frame and the second data frame are control data frames.